

REMARKS

This Amendment is filed in response to the Office Action mailed June 2nd, 2005 and the Office Action mailed March 11th, 2005. All objections and rejections are respectfully traversed.

Claims 2-4, 6-13, and 15-29 are in the case.

Claims 6, 10, 11, 16, 19, 20, 22, 23, 25, 26, 28 and 29 have been amended.

No new claims have been added.

The Applicant respectfully requests an Interview with the Examiner to advance the prosecution of this case.

Allowable Subject Matter

At paragraphs 10 of the Office Action, the Examiner has indicated claims 2-4 and 6-11 would be allowable if rewritten to overcome rejections under 35 U.S.C. §112, second paragraph. As described below, such claims are now believed to be in condition for allowance.

Rejections under 35 U.S.C. §112

At paragraphs 3-4 of the Office Action claims 2-4, 6-9, 10-11, 16,17, 19, 20, 22, 23, 25, 26, 28, and 29 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner believed various phrases were unclear. To advance the prosecution of the case, the Applicant has amended the claims. Accordingly, the Applicant believes these claims are now in condition for allowance.

Rejections under 35 U.S.C. §102

At paragraph 9 and 10 of the Office Action, claims 16, 17, 19, 20, 22, 23, 25, 26, 28, and 29 were rejected under 35 U.S.C. §102(e) as being anticipated by Ronstrom, U.S. Patent No. 6,438,707, issued on Aug. 20th, 2002 (hereinafter Ronstrom).

The Applicant appreciates the Examiner's Response to Arguments at paragraph 11 of the Office Action, and would like to address such statements. While the Applicant believes the claims as originally filed implicitly contained a time order (i.e. **before** and **later**), to advance the prosecution of the case, the Applicant has amended the claims to make the time order more clear. The Applicant has added the phrase "***subsequent to the steps of providing and passing.***" Such statement emphasizes that the event instance is passed to the standby supervisor before any notification that applications ***have completed processing of the event instance.***

Applicant's claim 16, representative in part of the other rejected claims, sets forth:

16. A method for operating a network device, comprising:

operating an active supervisor, the active supervisor creating an event instance in response to a change in operating state from a requesting application;

providing, by the active supervisor, the event instance to the requesting application and listening applications that have registered for the event for processing;

passing, by the active supervisor, the event instance to a standby supervisor;

subsequent to the steps of providing and passing, receiving, at the active supervisor, notifications from the requesting and listening applications that the requesting and listening applications have completed processing of the event instance;

passing, by the active supervisor, the notifications to the standby supervisor; and

in response to receiving the notifications from the requesting and all listening applications, closing the event instance at the active and standby supervisors.

Ronstrom describes a fault tolerant computer system including a primary and a backup (standby) processing unit, where the standby unit may “take over” in the event of a failure of the primary unit. Ronstrom emphasizes repeatedly that “advantageously, the primary processing unit reports an event message to the backup system only in case the execution of an event is halted.” *See Ronstrom* col. 2, lines 41-43. That is, “as an important feature of the invention [in Ronstrom], event messages are generated once the execution of the event process is halted/terminated, thus being able to deliver accurate information about the execution of the event process to the backup system....” *See Ronstrom* col. 9, lines 7-11.

The Applicant respectfully urges that Ronstrom is silent concerning the Applicant’s claimed “*passing, by the active supervisor, the event instance to a standby supervisor; subsequent to the steps of providing and passing, receiving, at the active supervisor, notifications from the requesting and listening applications that the requesting and listening applications have completed processing of the event instance; passing, by the active supervisor, the notifications to the standby supervisor; and in response to receiving the notifications from the requesting and all listening applications, closing the event instance at the active and standby supervisors.*”

The Applicant claims *passing...the event instance to a standby supervisor*, and *subsequent to the steps of providing and passing*, receiving notifications that the applications have *completed processing of the event instance*. In this way, the Applicant provides information about the event instance to the standby supervisor before the completion of processing of the event instance. In sharp contrast, Ronstrom does not notify his backup system of an event before processing of an event is complete. Indeed, Ronstrom teaches away from the Applicant’s claims, directing that “advantageously” and as

an “important feature” one should only report event message to a backup system after the execution of the event is halted/terminated.

A system built according to Ronstrom has the disadvantage that if the primary system crashes, all non-complete events are lost, i.e. unknown to the backup system. This is undesirable and results in repeated computations and slower system performance. The Applicant addresses this disadvantage, in part, by *passing, by the active supervisor, the event instance to a standby supervisor* and subsequent ... passing, by the active supervisor, the notifications to the standby supervisor that processing is complete. Accordingly, if Applicant’s primary supervisor crashes while an event instance is being processed, the backup supervisor will still be aware of the event instance.

In summary, if one were to follow the disclosure of Ronstrom, they would be unable to practice the Applicant’s novel claims.

Accordingly, the Applicant respectfully urges that Ronstrom is legally insufficient to anticipate the present claims under 35 U.S.C. §102, because of the absence of the Applicant’s claimed novel “*passing, by the active supervisor, the event instance to a standby supervisor; subsequent to the steps of providing and passing, receiving, at the active supervisor, notifications from the requesting and listening applications that the requesting and listening applications have completed processing of the event instance; passing, by the active supervisor, the notifications to the standby supervisor; and in response to receiving the notifications from the requesting and all listening applications, closing the event instance at the active and standby supervisors.*”

Rejections under 35 U.S.C. §103

At paragraph 8 of the Office Action, claims 12 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kicklighter, U.S. Patent No. 6,005,841, issued on Dec 21st, 1999 (hereinafter Kicklighter) in view of Freedman, U.S. Patent No. 4,342,083, issued on July 27th, 1982 (hereinafter Freedman).

At paragraph 11 of the Office Action the Examiner provided a Response to Arguments. In such response, the Examiner asserts that a sequence mechanism is disclosed in Kicklighter and such sequence mechanism ensures Kicklighter's PRI-32 card's (supervisors) have state variables that are consistent with Kicklighter's line card's state variables. *See Kicklighter* Fig 1, items 38 and items 26. Yet, Kicklighter lacks such mechanism. Indeed the passage of Kicklighter that the Examiner cites to for this feature merely describes timing signals sent between a CPU card and a supervisor card. Such passage makes no mention of state variables, or synchronizing them between a supervisor card and a line card.

The Applicant's claim 12, representative in part of the other rejected claims, sets forth:

12. An intermediate network device for use in a computer network, the network device comprising:
 - a first supervisor card in communicating relationship with the one or more line cards;
 - a second supervisor card in communication relations with the first supervisor card;
 - an application loaded onto the first and second supervisor cards, the application configured to define and manipulate a plurality of state variables;
 - at least one line card defining a plurality of ports for forwarding messages across the computer network, the at least one line card in communicating relationship with the first and second supervisor cards and

configured to receive and maintain port state information from the application; and

a high availability entity disposed on both the first and second supervisor cards, the high availability entities comprising:

an event mechanism for notifying a selected one of the first or second supervisor cards of changes to the application's state variables;

a database mechanism for storing the state variables at the first and second supervisor cards; and

a sequence mechanism for ensuring that the state variables stored at the first and second supervisor cards are consistent with the port state information maintained at the at least one line card, the sequence mechanism resetting the at least one line card in the event that the state variables and the port state information differ after a failure of one of the first or second supervisor cards.

Kicklighter describes a redundancy arrangement for a telecommunications system that uses an active and a standby device in connection with a telecommunications switch. While the active device is in service, the standby device receives all incoming data, but does not process it. *See Kicklighter* col. 2, lines 20-24. Specifically, Kicklighter discloses PRI-32 packet engine cards (*see* Fig 1, item 38) as the active and standby devices, and exchanging timing signals between the PRI-32 cards and a CPU card (*see* Fig 1, item 44a). *See Kicklighter* col. 4, lines 51-67.

Freedman describes a distributed computing system including a plurality of computers connected by communication links. Each computer includes a CPU (104), a Memory (106), a Fault Handler (204), a Scheduler (206) and other devices. *See Freedman* col. 7, lines 39-46. A "Synchronizer" module in the Fault Handler of each computer generates "Sampling Numbers" and other messages that serve in synchronizing of the computers. If a computer loses synchronization, it is detected by the Fault Handlers (204) and messages received from the computer are discarded until the computer is re-

synchronized. *See Freedman* col. 17, lines 11-66. Further the “Synchronizer” of an unsynchronized computer may issue a “restart” message to the Fault Handler (204), or other device in efforts to regain synchronization. *See Freedman* col. 16, lines 42-51.

The Applicant respectfully urges that both Kicklighter and Freedman are silent concerning the Applicant’s claimed “*a sequence mechanism for ensuring that the state variables stored at the first and second supervisor cards are consistent with the port state information maintained at the at least one line card, the sequence mechanism resetting the at least one line card in the event that the state variables and the port state information differ after a failure of one of the first or second supervisor cards.*”

The Applicant teaches a *sequence mechanism for ensuring that the state variables* of supervisor cards are consistent with *state information maintained at the at least one line card*, and *resetting the at least one line card* if the information differs. As discussed above, Kicklighter is silent concerning a sequencing mechanism for state variable between supervisor and line cards. Instead, Kicklighter discusses synchronization between a CPU and a PRI-32 card (supervisor card), a different type of operation. Freedman, similarly lacks any disclosure of Applicant’s sequence mechanism that ensures state variables of supervisor cards and line cards are consistent. Freedman, merely discusses mechanisms for **synchronizing separate computer systems on a network**.

In summary, given the disclosure of Kicklighter and Freedman there no suggestion to practice the Applicant’s claims.

Accordingly, the Applicant respectfully urges that the combination of Kicklighter and Freeman is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant’s claimed novel “*a sequence mechanism for ensuring that the state variables stored at the first and second supervisor cards are*

consistent with the port state information maintained at the at least one line card, the sequence mechanism resetting the at least one line card in the event that the state variables and the port state information differ after a failure of one of the first or second supervisor cards.”

At paragraph 9 of the Office Action claims 15, 18, 21, 24, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Horst, U.S. Patent No. 5,838,894, issued on Nov 17th, 1998 (hereinafter Horst) in view of Ronstrom.

The Applicant’s claim 15, representative in part of the other rejected claims, sets forth:

15. A method for operating a network device, comprising:

- operating an active supervisor, the active supervisor receiving state information from at least one line card;
- generating a sequence number by the active supervisor in response to receipt of the state information;
- returning the sequence number to the at least one line card;
- storing the state information and sequence number to a standby supervisor;
- in response to failure of the active supervisor, switching control to the standby supervisor;
- comparing, by the standby supervisor, a stored sequence number with a reported sequence number, the reported sequence number reported by a line card; and*
- resetting the line card if the reported sequence number is different than the stored sequence number.*

Horst describes a computing system with a pair of CPUs that intercommunicate with two or more routers. A SYNC CLK signal is provided, and its rising edge may trigger a router to enter a “temporary non-operating reset state.” See

Horst col. 77, lines 32-49. Similarly, CPUs may halt and restart their clocks in response to the SYNC CLK signal. *See Horst* Fig. 31A, items 962-964.

Ronstrom, as discussed earlier, describes a primary system that passes event information for terminated/halted events to a backup system. *See Ronstrom* Fig. 6 and col. 16, lines 55 to col. 17, line 3. Ronstrom further discloses an, “event message may include a sequence number indicating an execution sequence of event processes, for example, if the sequence of event processes is not defined by the sequence of reception of event messages at the at least one backup system..” *See Ronstrom* col. 3, lines 52-56

The Applicant respectfully urges that both Horst and Ronstrom are silent regarding the Applicant’s claimed “***comparing, by the standby supervisor, a stored sequence number with a reported sequence number, the reported sequence number reported by a line card; and resetting the line card if the reported sequence number is different than the stored sequence number.***”

The Applicant novelly teaches a ***sequence number***, and ***comparing, by the standby supervisor, a stored sequence number with a reported sequence number, the reported sequence number reported by a line card.*** Horst merely discloses system a SYNC CLK signal, ***a type of clock signal*** that is said to run at 3.125 MHz and whose rising edge may trigger certain events. *See Horst* col. 76, lines 45-52. Ronstrom, discloses a sequence number of sorts, but merely uses this sequence number to “indicat[e] an execution sequence of event processes, for example, if the sequence of event processes is not defined by the sequence of reception of event messages.” *See Ronstrom* col. 3, lines 52-56. Neither reference discloses the Applicants novel ***comparing... a stored sequence number with a reported sequence number*** and ***resetting*** a line card in response to such comparison.

In summary, given the disclosure of Horst and Ronstrom there is no suggestion to practice the Applicants comparing... step.

Accordingly, the Applicant respectfully urges that the combination of Horst and Ronstrom is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant's claimed novel "*comparing, by the standby supervisor, a stored sequence number with a reported sequence number, the reported sequence number reported by a line card; and resetting the line card if the reported sequence number is different than the stored sequence number.*"

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-3078.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account

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Respectfully submitted,



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